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(56) Documents Cited
GB 0849988 A GB 0414788 A GB 0335170 A
WO 90/15951 A1

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(54) Abstract Title
Connector

(57) Apparatus for connecting a source of flowable material, eg. a bag, fig.4, with dispensing equipment 3, comprises a device adapted to operate a valve 5 of the equipment 3, eg. by use of a spigot 4, to provide flow from the source through the apparatus to the dispensing equipment. As described the device is a single piece, moulded plastic, tube shaped connector 1, fig.1, detachably connectable at a first end, via a screw thread, to a spout 8, fig.4, of the bag 2 and at a second end, via screw thread 10, to the back bar connector 11 of fluid dispenser 3 and the cylindrical spigot 4, mounted on a cruciform support 13, engages and opens the valve 5 in the connector 11 as the container is screwed to the dispenser. The spigot 4 may be formed integrally with shoulders (18, fig.2)of a frangible disc, so that the container seal is broken irrevocably before the spigot 4 is held in the passageway 12 by the shoulders, opening the valve 5 upon closer engagement of the container via screw thread 10. The connector may further comprise a non return valve (21, fig.3), mounted On a T-shaped boss, with two actuating rods projecting symmetrically from the valve which engage part 25 on the connector 11 to lift a peripheral skirt off the shoulders to open the fluid flow path.

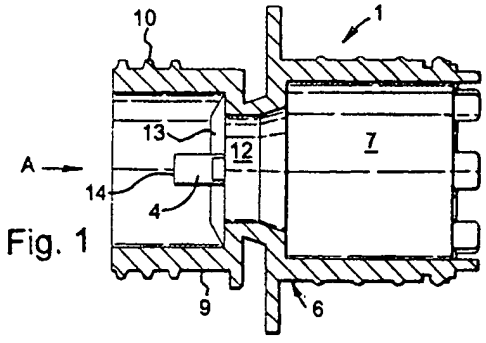

Fig. 1

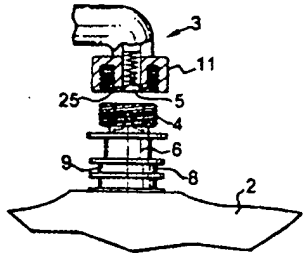

Fig. 4

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

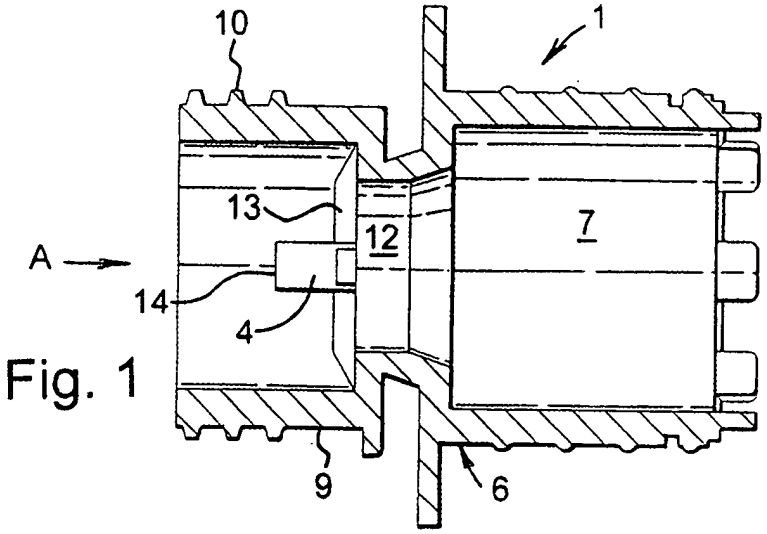

Fig. 1

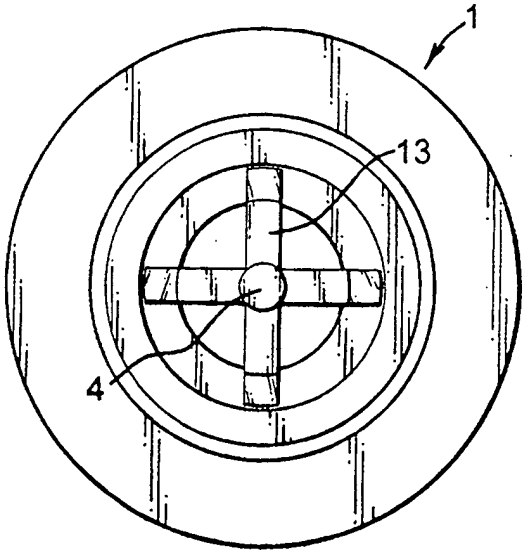

Fig. 1A

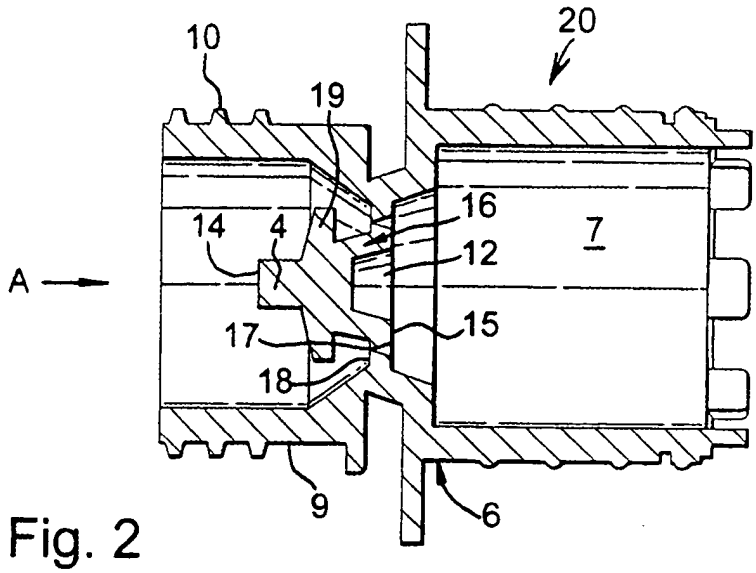

Fig. 2

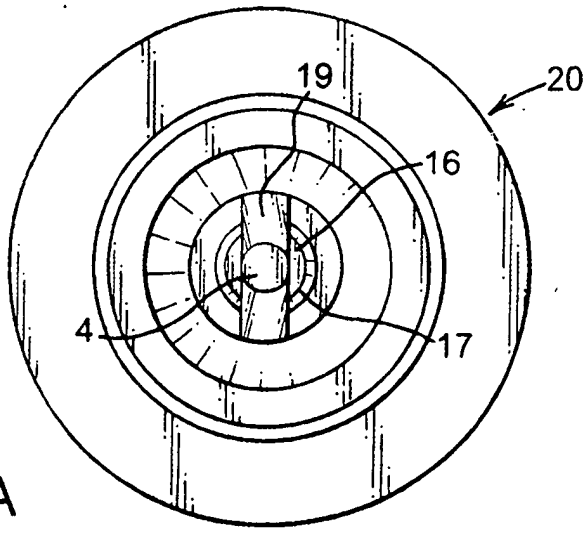

Fig. 2A

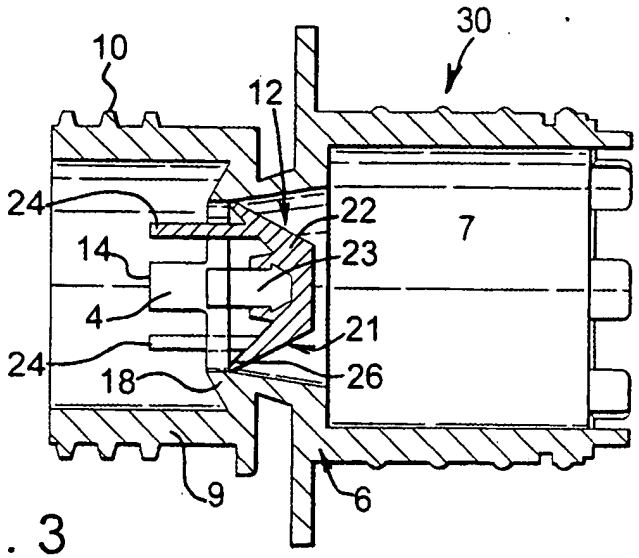

Fig. 3

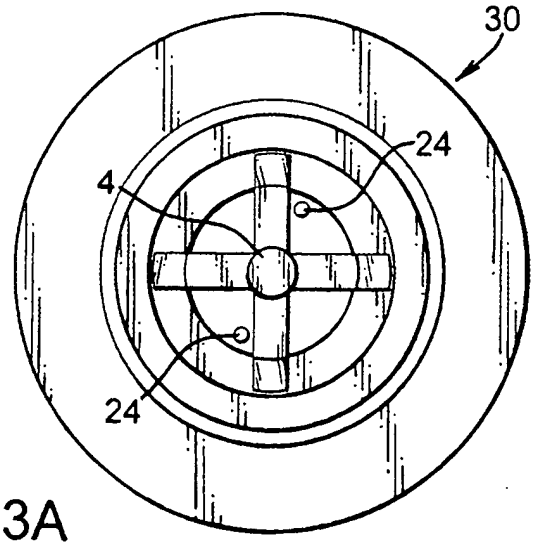

Fig. 3A

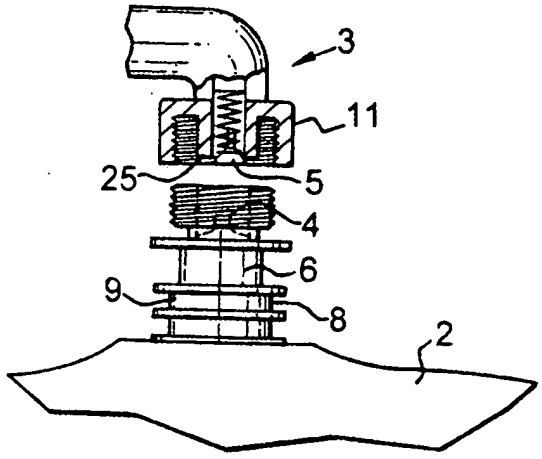

Fig. 4

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CONNECTORS

The invention relates to connectors, particularly to such as are used to connect a source of flowable material such as a bag of liquid, with dispensing equipment for such liquid.

It is an object of the invention to seek to provide a relatively simple connector.

According to a first aspect of the invention there is provided apparatus for connecting a source of flowable material with dispensing equipment, comprising a device adapted to operate a valve of the dispensing equipment, whereby to provide flow from the source through the apparatus to the dispensing equipment.

The device may comprise a spigot which has a surface for engagement with the valve in use. This provides for positive actuation of the dispensing equipment.

The spigot may be cylindrical and the surface may be carried by a free end thereof. This provides a relatively simple construction.

The spigot may be carried by carrier means which allows passage therearound of fluid in use. This provides for relatively unobstructed flow of material in operation, particularly when the carrier means may comprise a cruciform configuration in plan view.

The device may comprise a valve adapted to cut off flow of material

from an upstream side of the device to a downstream side. This provides for control of flow.

The valve may comprise a diaphragm valve. This is a relatively inexpensive valve particularly when the diaphragm valve may comprise two component parts which may be assembled together with a push fit.

One part may comprise a frusto-conical member directed in a direction away from the spigot. This provides for ease of construction and operation, particularly when the member may be a flexible member, for example of a relatively inexpensive material such as a rubber or a rubber-like material.

There may be actuating means for lifting the diaphragm valve from a valve seat therefor. This provides for ease of operation, particularly when the actuating means may comprise push rod means adapted to be actuated by the dispensing equipment in use.

There may be two push rod means arranged symmetrically with respect to the device. This provides for a positive balanced operation without canting.

The device may comprise a tamper evident device. This prevents tampering with the contents of the source prior to connection with dispensing equipment.

The tamper-evident device may comprise a part which carries the

spigot and which has a frangible part for opening a flow path from an upstream to a downstream side of the spigot. This is a relatively simple yet effective construction.

The device may comprise stop means to prevent the device moving to the source when the frangible part is broken. This construction seeks to prevent interruption of the flow or damage to the source.

The stop means may comprise a bar carrying the spigot and shoulder means of the apparatus in the flow path. Thus the bar and shoulders can cooperate to arrest movement of the device towards the source.

There may be actuating means for lifting the diaphragm valve from a valve seat therefor. This provides for positive operation, particularly when the actuating means may comprise push rod means adapted to be actuated by the dispensing equipment in use.

There may be two push rod means arranged symmetrically with respect to the device. This provides for positive operation without canting of the valve.

According to a second aspect of the invention there is provided a bag of flowable material such as a liquid, comprising apparatus as hereinbefore defined mounted in a spout of the bag.

According to a third aspect of the invention there is provided a dispense system, comprising bar or dispense equipment connected with a bag by apparatus as hereinbefore defined.

Connectors embodying the invention are hereinafter described, by way of example, with reference to the accompanying drawings.

Figs, 1 and 1A, 2 and 2A, and 3 and 3A, show respectively a transverse sectional view and an end elevational view (in the direction of arrow 'A') of first, second and third embodiments of connector according to the invention; and

Fig. 4 shows a schematic view of a connector according to the invention a dispense system.

Referring to the drawings, in which like parts are referred to by like reference numerals, there is shown apparatus 1, 20, 30 for connecting a source 2 of flowable material with dispensing equipment 3, comprising a device 4 adapted to operate a valve 5 of the dispensing equipment 3 whereby to provide flow from the source through the apparatus 1, 20, 30 to the dispensing equipment 3.

In all the embodiments the apparatus 1, 20 or 30 comprises a unitary body 6, moulded in plastic having a first hollow part for mounting on a fill/dispense boss or spout 8, of the source 2 of material, which is usually and is in the embodiment a plastic bag charged with liquid, which is to be dispensed by the dispensing equipment 3 (Fig. 4), the unitary body 6 of the apparatus 1, 20 or 30 having a second part 9 with an external screw thread 10 by which it is connected to a back bar connector 11 of the dispensing equipment.

There is a passage 12 between the two body parts 7, 9 which is

bridged in the first embodiment (Figs. 1 and 1A) by carrier means in the form of a cruciform support 13 which supports the device 4 which is a cylindrical spigot having a contact surface 14 at its free end.

In operation, as the part 9 and back bar connector 11 are screwed together, the spigot 4 contacts a valve 15 in the back bar connector 11 to open a flow passage to the dispense equipment 3. Liquid can then flow from the bag 2, through the body part 7, the passage 12 round the cruciform carrier 13, through the body part 9 and into the dispensing equipment 3.

The embodiment 20 of Figs. 2 and 2A is similar to that of Figs. 1 and 1A though in the case of the second embodiment the spigot 4 is carried by a one piece moulding 16 which is in the form of a disc 15 which bridges the passage 12 and indeed initially blocks it. When the apparatus 20 is screwed into engagement with the back bar connector 11, the spigot 4 opens the valve 5 as before, but on continued tightening of the connection, the pressure shears the disc 15 at a thinned peripheral part 17 where it joins shoulders 18 of the body projecting into the passage 12.

The spigot 4 is therefore frangible. When free, the spigot 4 is supported on the shoulders 18 by stop means in the form of a bar 19 carrying the spigot 11. The device 4 in this embodiment thus also acts as a tamper-evident member, because before connection if it is intact, and not subject to tampering, then no flow of fluid is possible through the body 6 because the disc 15 is not ruptured.

If there is evidence of liquid in the part 9, then there has been tampering. The second embodiment 20 also allows the bag 2 or pack on which it is carried to be laid flat to connect it with the back bar connector 11 as liquid cannot flow out until the disc 15 is sheared. This is required when using existing dispensing equipment 3.

Figs. 3 and 3A show a third embodiment 30 in which there is a non-return valve 21 housed in the body 6, and arranged to obturate and open the passage 12. The valve 6 is in two parts comprising a flexible frusto-conical part 22 of rubber or like material snap-engaged on a boss 23 having a 'T' or similar enlarged head. There is actuating means in the form of two rods 24 which project from the valve symmetrically on either side of the spigot 4, for balance and smoothness of operation. When the apparatus 30 is mounted on the back bar connector 11 as before, the rods 24 engage the part 25 and on tightening, push the valve 21 into the part 7 so that a peripheral skirt 26 lifts off the shoulders 18 to open the flow path for liquid from the bag. On disconnection, the valve 26 automatically returns to the position shown in Fig. 3, under liquid pressure on the bag 2.

In all embodiments, the apparatus 1, 20 or 30 will be supplied partially inserted in the spout 8 of the bag 2, and after charging of the bag with liquid, will be fully inserted.

CLAIMS

1. Apparatus for connecting a source of flowable material with dispensing equipment, comprising a device adapted to operate a valve of the dispensing equipment, whereby to provide flow from the source through the apparatus to the dispensing equipment.

2. Apparatus according to Claim 1, the device comprising a spigot which has a surface for engagement with the valve in use.

3. Apparatus according to Claim 1, the spigot being cylindrical and the surface being carried by a free end thereof.

4. Apparatus according to Claim 3, the spigot being carried by carrier means which allows passage therearound of fluid in use.

5. Apparatus according to Claim 4, the carrier means comprising a cruciform configuration in plan view.

6. Apparatus according to Claim 5, the device comprising a valve adapted to cut off flow of material from an upstream side of the device to a downstream side.

7. Apparatus according to Claim 6, the valve comprising a diaphragm valve.

8. Apparatus according to Claim 7, the diaphragm valve comprising two component parts.

9. Apparatus according to Claim 8, one part comprising a frusto-conical member directed in a direction away from the spigot.

10. Apparatus according to Claim 9, the member being a flexible member.

11. Apparatus according to Claim 10, the member comprising a rubber or a rubber-like material.

12. Apparatus according to any of Claims 7 to 11, there being actuating means for lifting the diaphragm valve from a valve seat therefor.

13. Apparatus according to Claim 12, the actuating means comprising push rod means adapted to be actuated by the dispensing equipment in use.

14. Apparatus according to Claim 13, there being two push rod means arranged symmetrically with respect to the device.

15. Apparatus according to any of claims 1 to 3, the device comprising a tamper-evident device.

16. Apparatus according to Claim 15, the tamper-evident device comprising a part which carries the spigot and which has a frangible part for opening a flow path from an upstream to a downstream side of the spigot.

17. Apparatus according to Claim 16, the device comprising stop means to prevent the device moving to the source when the frangible part is broken.

18. Apparatus according to Claim 17, the stop means comprising a bar carrying the spigot and shoulder means of the apparatus in the flow path.

19. Apparatus for connecting a source of flowable material with dispensing equipment, substantially as hereinbefore described with reference to the accompanying drawings.

20. A bag of flowable material such as a liquid, comprising apparatus according to any preceding claim mounted in a spout of the bag.

21. A dispense system, comprising bar or dispense equipment connected with a bag by apparatus according to any of Claims 1 to 19.

The Patent Office

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Application No: GB 9820623.8 **Examiner:** Michael Young
Claims searched: all **Date of search:** 2 December 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): B8T (TEDV, TFDL, TEFX). F2G (G25A, G25B)

Int Cl (Ed.6): B67D 3/04, 5/02. B67C 3/26

Other: ONLINE: WPI EPODOC JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 849988	(LOWENTHAL)	1-4
X	GB 414788	(ELWISS)	1-4
X	GB 335170	(THOMPSON MANUFACTURING CO)	1-4
X	WO 90/15951 A1	(SONOCO LTD)	1-4

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